CODE 340

COMMERCIAL MASONRY MORTARS PERFORMANCE IN AGGRESSIVE SOLUTIONS

Menéndez, Esperanza[1], Argiz, Cristina[2], Sanjuán, Miguel Ángel[3]*

1: Instituto de Ciencias de la Construcción Eduardo Torroja (CSIC)
C/ Serrano Galvache, 4, 28033 Madrid, Spain
e-mail: emm@ietcc.csic.es, web: http://www.ietcc.es
2: E.T.S. Ingenieros de Caminos, Canales y Puertos. Universidad Politécnica de Madrid
C/ Profesor Aranguren, s/n, Ciudad Universitaria, 28040 Madrid, Spain.
e-mail: cg.argiz@upm.es; web: http://www.upm.es
3: Instituto Español del Cemento y sus Aplicaciones (IECA)
C/ José Abascal, 53, 28003 Madrid, Spain
e-mail: masanjuan@ieca.es, web: http://www.ieca.com

KEYWORDS: Edification pathology; durability; masonry mortars; efflorescence.

ABSTRACT

Four masonry mortars, two M5 and two M7.5 according to EN 998-2:2010, were subjected to nine aggressive solutions (NaCl -20g/l y 50g/l- Na_2SO_4 -20g/l y 50g/l-, sea water according to the American standard ASTM D665, K_2SO_4 -2,7g/l- Na_2SO_4 -1,8 g/l- NaCl -0,5 g/l- an a solution prepared mixing these three last ones) with the scope of assessing their resistance to efflorescence. All masonry mortars were factory produced mortars. They were immersed in the testing solutions and the time when the efflorescence occurs was recorded. Also, the affected area was calculated. The results were compared with those found in tap and distilled water where no efflorescence was detected. This fact evidences that the migration of internal mortar components to the surface of this porous material does not happen. By contrary, the most aggressive solutions have been those containing a high concentration of sodium sulfate, i.e. both solutions made of 20 and 50 g/l Na_2SO_4. The four mortars subjected to these solutions showed efflorescence after one day of testing and the affected area was found to be about 40 cm^2. Therefore, the essential process involves the ions migration from the aggressive solution to the porous mortar by absorption and diffusion. The mortar pore solution, with the ions now held in solution, migrates to the surface, then evaporates, leaving a coating of the precipitated ions in form of different salts.